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REVIEWS

The Antiquity of Man in Europe. By JAMES GEIKIE. New York: D. VanNostrand Co., 1914. Pp. 305. Illustrated.

As stated in the preface, this volume consists of a series of ten lectures delivered to a mixed audience and hence contains much elementary matter. It takes up first the migrations of the southern and temperate, the tundra or snow-loving, and the steppe fauna and flora in their relation to climatic changes in the Pleistocene epoch. The second and third lectures discuss cave deposits and human and animal relics and the archaeological stages of culture. The fourth lecture deals with river deposits and the succession of archaeological culture stages contained in them. A brief discussion of the loess and its relation to tundra and steppe conditions is also presented.

In chap. v, under the heading "Glacial Action," there is not only a discussion of glacial action proper, but also of the formation of screes, of the flowing soils of artic regions, and of the breccias of Gibraltar. Erosion of rock basins and overdeepening of valleys by glacial action is given prominence. In the following chapter, which deals with the glaciation of northern Europe, submarine basins in the Irish Sea and near the Hebrides, and the overdeepened valleys and fiords of Norway are referred to glacial action. Rock rubble in non-glaciated areas is also described. The thickness, extent, and direction of flow of the British as well as Scandinavian ice fields form the main theme. In chap. vii, the glaciation of the Alps and overdeepening of Alpine valleys and the glaciation of other mountains in middle and southern Europe are discussed; also the general climatic conditions of middle Europe in glacial and interglacial stages, and conditions favorable for loess deposition. The climatic conditions of the several interglacial stages and the different kinds of interglacial deposits are treated in the next chapter. The two concluding chapters deal with the history of the Pleistocene epoch, and the relation of the archaeological culture stages to the general glacial and interglacial stages. Estimates of geological time are briefly considered.

The volume is illustrated by 21 full-page plates of which 17 show characteristic animals, plants, and Paleolithic implements. The

remainder are photographs of Alpine scenes. There are also four small folded maps as follows: A. Europe during the second glacial epoch; B. Europe in interglacial times; C. Europe during the third glacial epoch; D. Europe during the fourth glacial epoch. The fourth glacial epoch as interpreted by Geikie corresponds to only the early part of the fourth or Würm Stage of Alpine glaciation. The fifth and sixth glacial stages of Geikie's classification seem likely to be represented in America by such strong readvances of the ice as the readvance to the Port Huron morainic system.

The aim of the author has been to deal with the question of the antiquity of man in Europe from the geological standpoint, and he maintains that it is chiefly by following geological methods of investigation that the successive stages of human culture are put on a firm and reliable basis. The discussion is restricted wholly to Europe with no reference to Asiatic invasions. In fact no intimation is given that the present people in Europe had any other line of descent than through the Paleolithic and Neolithic man. The earliest Paleolithic man is, on geological grounds, estimated to have appeared somewhere between 250,000 and 500,000 years ago. A more precise estimate is not considered possible in the present state of knowledge.

FRANK LEVERETT

ANN ARBOR, MICHIGAN

Twenty-second Annual Report of the Bureau of Mines, Ontario.

Vol. XXII, Part I, 1913. By THOMAS W. GIBSON. Pp. 284,
pls. 84, sketch maps 5, sheet maps 4.

This bulletin contains ten articles and reports. It commences with a review of the mining operations and production of the province during the year 1912. The value of the mineral output was \$48,341,612—15 per cent greater than that of 1911. The decreasing production of the Cobalt region was compensated by a great enough rise in the price of silver to show an increase in the total value produced during the year. The Porcupine region added a million and three-quarters dollars' worth of gold to the annual output of the province. The year showed an increase in the output of both metallic and non-metallic minerals, but a much greater increase in the metallic.

The mines of Ontario are described by Mr. E. T. Corkell. He gives details of mine development, treatment of the ores, and production of the mines.